**WHAT IS CLAIMED IS:**

1. An apparatus for the detection of an object contained in a work area, comprising:

a tag element affixed to a larger-sized said object, said tag element comprising an electronic signal emitter contained within a protective means; and

an electronically operable interrogation and detection member, enabled to locate the tag element within a predetermined distance therefrom, comprising (i) first means for the emission of pulsed wideband signals in each coordinate direction of a multi-directional coordinate system, each wideband signal including a signal which prompts the tag element to provide a return signal, and (ii) second means for the reception and analysis of the return signal,

wherein multiple pulsed signals emitted from the first means cause the return signals of the tag element to increase in intensity at a detectable frequency sufficiently over ambient noise levels to facilitate detection of the tag element and object attached thereto.

2. The apparatus according to claim 1, wherein the tag element is bead shaped and includes a response signal emitter encapsulated in a bio-inert hard shell, the response signal emitter comprises a ferrite rod and a coil wire therearound with a means for providing capacitance coupled thereto.

3. The apparatus according to claim 2, wherein the bead shaped tag element further includes means for attachment to the object.

4. The apparatus according to claim 3, wherein the work area is a surgical site, the object includes a surgical sponge and said means for attachment comprises flexible threads anchored in the bead to enable attachment to threads of the sponge.

5. The apparatus according to claim 3, wherein the work area is a surgical site, the object is a laparotomy sponge and said means for attachment comprises a rivet attachment member and an eyelet member in which the tag element is attached to a marker loop of the laparotomy sponge.

6. The apparatus according to claim 2, wherein the response signal emitter further comprises a protective diode coupled to prevent accidental burn-out thereof caused by proximate electrical equipment.

7. The apparatus according to claim 1, wherein the electronic signal emitter comprises a single loop, with winding, contained in an elastomeric coating as a thread element.

8. The apparatus according to claim 1, wherein the electronic signal emitter comprises a single elongated U-shaped wire with a capacitance element coupling the ends thereof, and enclosed within a flexible casing.

9. The apparatus according to claim 1, wherein the interrogation and detection member is comprised of an antenna portion shared for both transmit and receive functions and a handle portion to which the antenna is detachably connected, the handle portion contains first electronic means for pulsed wideband

transmission and second electronic means for detecting and analyzing the response signals, and the antenna portion includes plural ring-shaped antennas for the emitting of a pulsed wideband signal as an electromagnetic signal in each coordinate direction of the multi-directional coordinate system employed.

10. The apparatus according to claim 9, wherein the antenna portion includes three mutually orthogonal ring-shaped antennas for the transmitting of the electromagnetic signal in the X, Y and Z -directions, respectively, of an X, Y and Z-coordinate system.

11. The apparatus according to claim 1, wherein the work area is a surgical site and the tag element is of such relatively small size as not to impede the functional use of an object to which it is affixed, the object being either deformable or non-deformable.

12. The apparatus according to claim 1, wherein the first means comprises an untuned transmitter.

13. The apparatus according to claim 1, wherein the first means includes an electronic portion configured to produce pulse-width modulated (PWM) wideband signals.

14. The apparatus according to claim 1, wherein the first means includes an electronic portion configured to produce voltage-modulated wideband signals.

15. The apparatus according to claim 1, wherein the first means includes an electronic portion configured to produce pulsed wideband signals in which one of either the voltage levels of pulses are varied over time or pulse width variation is effected over time to enhance discrimination of the tag element response signals from ambient noise.

16. The apparatus according to claim 1,

wherein the first means includes an electronic portion configured to produce either one of pulse-width modulated wideband interrogation signals or voltage-modulated wideband interrogation signals, and

wherein the second means includes (i) a second electronic portion configured to receive and analyze the narrowband return signals, the second electronic portion including a wideband receiver containing filter and pre-amplifier circuits to reduce noise bandwidth of incoming signals and increase detection range of the interrogation and detection member, and (ii) a signal processor to transform the response signals into a resulting narrowband return signal having sufficient strength to be distinguishable from ambient noise.

17. The apparatus according to claim 1, wherein the tag element is a low Q tag element.

18. An apparatus for electronic detection of an object contained in a work area comprising:

a first electronic circuit, coupled to a transmit/receive antenna, configured to emit either one of pulse-width modulated wideband interrogation signals or voltage-modulated interrogation signals,

a tag element affixed to a larger-sized said object, the tag element being adapted to respond to each pulse of an interrogation signal with a relatively small narrow return signal centered about a specific, but not predetermined frequency;

a second electronic circuit, coupled to said transmit/receive antenna, having wideband receiver compatibility comprising means for optimal reception within a predetermined distance range from the object, and

a signal processor to transform the return signals into a resulting narrowband return signal having sufficient intensity to be distinguishable from ambient noise.

19. The apparatus according to claim 18, wherein the work area is a surgical site and the tag element is of such relatively small size as not to impede the functional use of an object to which it is affixed, the object being either deformable or non-deformable.

20. The apparatus according to claim 18, wherein the first and second electronic circuits are contained in a handle portion to which the transmit/receive antenna is detachably connected, the handle portion and the transmit/receive antenna constitute a hand-held scanning detection device.

21. The apparatus according to claim 20, wherein the transmit/receive antenna includes plural ring-shaped antennas for the emitting of a pulsed wideband

signal as an electromagnetic signal in each coordinate direction of a multi-directional coordinate system employed.

22. The apparatus according to claim 21, wherein the antenna portion includes three mutually orthogonal ring-shaped antennas for the transmitting of the electromagnetic signal in the X, Y and Z -directions, respectively, of an X, Y and Z-coordinate system.

23. The apparatus according to claim 22, wherein the tag element is a low Q tag element.

24. The apparatus according to claim 18, wherein the tag element is a low Q tag element.

25. A method for the detection of one or more foreign objects used in a surgical site, comprising:

attachably providing each foreign object used in surgery with a much smaller tag element which does not interfere with utilization of the foreign object,

wherein the tag element includes means for responding to a wideband signal, with a response signal centered about a specific but not a predetermined frequency; and

after completion of a surgical procedure, scanning the surgical site with a scanning detection device which includes a transmitter and receiver, the transmitter emitting either one of a pulse-width modulated wideband interrogation signal or a voltage-modulated wideband interrogation signal

containing a frequency at which the tag element responds with a single response signal for each emitted pulse reaching the tag element, each pulse of the wideband interrogation signal being of such duration as to cause the return signals from the tag element to become cumulatively increased in intensity, resulting in a narrowband return signal having sufficient intensity to be distinguishable from background noise, to facilitate detection of the tag element and object attached thereto.

26. The method according to claim 25, wherein the scanning detection device is a handheld device including (i) a handle portion containing electrical components of the transmitter and receiver, and (ii) an antenna portion shared for both transmit and receive functions which is detachably connected to the handle portion, the antenna portion includes plural ring-shaped antennas for the emitting of a pulsed wideband signal as an electromagnetic signal in each coordinate direction of a multi-directional coordinate system.

27. The method according to claim 26, wherein the antenna portion includes three mutually orthogonal ring-shaped antennas for the transmitting of the electromagnetic signal in the X, Y and Z -directions, respectively, of an X, Y and Z-coordinate system.

28. The method according to claim 27, wherein the tag element is a low Q tag element.

29. The method according to claim 25, wherein the tag element is a low Q tag element.